

§73.317

information and patterns must be provided for angles of -10 deg. from the horizontal plane and sufficient additional information must be included on that portion of the pattern lying between $+10$ deg. and the zenith and -10 deg. and the nadir, to conclusively demonstrate the absence of undesirable lobes in these areas. The vertical plane pattern must be plotted on rectangular coordinate paper with reference to the horizontal plane. In the case of a composite antenna composed of two or more individual antennas, the composite antenna pattern should be used, and not the pattern for each of the individual antennas.

(iv) A statement that the antenna is mounted on the top of an antenna tower recommended by the antenna manufacturer, or is side-mounted on a particular type of antenna tower in accordance with specific instructions provided by the antenna manufacturer.

(v) A statement that the directional antenna is not mounted on the top of an antenna tower which includes a top-mounted platform larger than the nominal cross-sectional area of the tower in the horizontal plane.

(vi) A statement that no other antenna of any type is mounted on the same tower level as a directional antenna, and that no antenna of any type is mounted within any horizontal or vertical distance specified by the antenna manufacturer as being necessary for proper directional operation.

(vii) A statement from an engineer listing such individual engineer's qualifications and certifying that the antenna has been installed pursuant to the manufacturer's instructions.

(viii) A statement from a licensed surveyor that the installed antenna is properly oriented.

(ix)(A) For a station authorized pursuant to §73.215 or Sec. §73.509, a showing that the root mean square (RMS) of the measured composite antenna pattern (encompassing both the horizontally and vertically polarized radiation components (in relative field)) is at least 85 percent of the RMS of the authorized composite directional antenna pattern (in relative field). The RMS value, for a composite antenna pattern specified in relative field val-

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ues, may be determined from the following formula:

RMS=the square root of:

$[(\text{relative field value } 1)^2 + (\text{relative field value } 2)^2 + \dots + (\text{last relative field value})^2]$

total number of relative field values

(B) where the relative field values are taken from at least 36 evenly spaced radials for the entire 360 degrees of azimuth. The application for license must also demonstrate that coverage of the community of license by the 70 dBu contour is maintained for stations authorized pursuant to §73.215 on Channels 221 through 300, as required by §73.315(a), while noncommercial educational stations operating on Channels 201 through 220 must show that the 60 dBu contour covers at least a portion of the community of license.

(d) Applications proposing the use of FM transmitting antennas in the immediate vicinity (*i.e.* 60 meters or less) of other FM or TV broadcast antennas must include a showing as to the expected effect, if any, of such approximate operation.

(e) Where an FM licensee or permittee proposes to mount its antenna on an AM antenna tower, or locate within 3.2 km of an AM antenna tower, the FM licensee or permittee must comply with §73.1692.

[28 FR 13623, Dec. 14, 1963, as amended at 34 FR 14222, Sept. 10, 1969; 37 FR 25841, Dec. 5, 1972; 43 FR 53738, Nov. 17, 1978; 48 FR 29508, June 27, 1983; 51 FR 17028, May 8, 1986; 54 FR 9804, Mar. 8, 1989; 56 FR 57294, Nov. 8, 1991; 62 FR 51058, Sept. 30, 1997; 63 FR 70047, Dec. 18, 1998]

§73.317 FM transmission system requirements.

(a) FM broadcast stations employing transmitters authorized after January 1, 1960, must maintain the bandwidth occupied by their emissions in accordance with the specification detailed below. FM broadcast stations employing transmitters installed or type accepted before January 1, 1960, must achieve the highest degree of compliance with these specifications practicable with their existing equipment. In either case, should harmful interference to other authorized stations occur, the licensee shall correct the problem promptly or cease operation.

(b) Any emission appearing on a frequency removed from the carrier by between 120 kHz and 240 kHz inclusive must be attenuated at least 25 dB below the level of the unmodulated carrier. Compliance with this requirement will be deemed to show the occupied bandwidth to be 240 kHz or less.

(c) Any emission appearing on a frequency removed from the carrier by more than 240 kHz and up to and including 600 kHz must be attenuated at least 35 dB below the level of the unmodulated carrier.

(d) Any emission appearing on a frequency removed from the carrier by more than 600 kHz must be attenuated at least $43 + 10 \log_{10}$ (Power, in watts) dB below the level of the unmodulated carrier, or 80 dB, whichever is the lesser attenuation.

(e) Preemphasis shall not be greater than the impedance-frequency characteristics of a series inductance resistance network having a time constant of 75 microseconds. (See upper curve of Figure 2 of § 73.333.)

[51 FR 17028, May 8, 1986]

§ 73.318 FM blanketing interference.

Areas adjacent to the transmitting antenna that receive a signal with a strength of 115 dBu (562 mV/m) or greater will be assumed to be blanketed. In determining the blanketed area, the 115 dBu contour is determined by calculating the inverse distance field using the effective radiated power of the maximum radiated lobe of the antenna without considering its vertical radiation pattern or height. For directional antennas, the effective radiated power in the pertinent bearing shall be used.

(a) The distance to the 115 dBu contour is determined using the following equation:

$$D \text{ (in kilometers)} = 0.394 \sqrt{P}$$

$$D \text{ (in miles)} = 0.245 \sqrt{P}$$

Where P is the maximum effective radiated power (ERP), measured in kilowatts, of the maximum radiated lobe.

(b) After January 1, 1985, permittees or licensees who either (1) commence program tests, or (2) replace their antennas, or (3) request facilities modifications and are issued a new construction permit must satisfy all com-

plaints of blanketing interference which are received by the station during a one year period. The period begins with the commencement of program tests, or commencement of programming utilizing the new antenna. Resolution of complaints shall be at no cost to the complainant. These requirements specifically do not include interference complaints resulting from malfunctioning or mistuned receivers, improperly installed antenna systems, or the use of high gain antennas or antenna booster amplifiers. Mobile receivers and non-RF devices such as tape recorders or hi-fi amplifiers (phonographs) are also excluded.

(c) A permittee collocating with one or more existing stations and beginning program tests on or after January 1, 1985, must assume full financial responsibility for remedying new complaints of blanketing interference for a period of one year. Two or more permittees that concurrently collocate on or after January 1, 1985, shall assume shared responsibility for remedying blanketing complaints within the blanketing area unless an offending station can be readily determined and then that station shall assume full financial responsibility.

(d) Following the one year period of full financial obligation to satisfy blanketing complaints, licensees shall provide technical information or assistance to complainants on remedies for blanketing interference.

[28 FR 13623, Dec. 14, 1963, as amended at 52 FR 25866, July 9, 1987]

§ 73.319 FM multiplex subcarrier technical standards.

(a) The technical specifications in this Section apply to all transmissions of FM multiplex subcarriers except those used for stereophonic sound broadcasts under the provisions of § 73.322.

(b) *Modulation.* Any form of modulation may be used for subcarrier operation.

(c) *Subcarrier baseband.* (1) During monophonic program transmissions, multiplex subcarriers and their significant sidebands must be within the range of 20 kHz to 99 kHz.